



Clean Air COMPASS

A collaborative, community-informed initiative to develop a customizable **open-source data management system** for air quality measurement data

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THE ISSUE

Air quality monitoring efforts require a data management system (DMS) so that data can be interpreted and applied for maximum effect.

Existing data management options have limitations:

- Proprietary systems are often expensive, unable to manage data from heterogeneous instruments, opaque, and overly controlling of the data.
- Custom-built DMSs are costly, require significant technical expertise, and require time and effort better spent on analysis and action.

THE SOLUTION

An easy-to-use and customizable open-source DMS available for any entity to tailor to their needs.

WHAT IS A DMS?

An air quality DMS is software that **collects, harmonizes, stores, validates, visualizes, and distributes data** from air quality monitoring networks and instruments. An open-source DMS is one whose source code (the code that runs the software program) is available to anyone who would like to view, copy, learn from, alter, or share it.

The Approach



THE BENEFITS

- **Reduce duplication** of efforts, saving time and money
- Facilitate greater data **consistency** and **coordination** among data producers
- **Remove barriers** related to licensing fees, proprietary systems, and technical capabilities
- **Improve access** for resource-limited organizations and communities
- **Foster collaboration** by providing a shared, transparent foundation for diverse stakeholders to contribute
- **Empower organizations and communities** to effectively use air quality data
- Spur impactful actions to **clean the air**
- Provide a **foundation for accessible development and enhancement** of advanced data capabilities

Examples of data management challenges

Maldives could benefit from a centralized air quality DMS. The country has several distinct monitoring networks comprised of reference monitors and air sensors and operated by various institutions. This situation not only makes interagency access and use of the data cumbersome but also makes public access difficult.

Clean air projects in Central Asia face restrictions around how and where data services may be hosted. Providing an open-source, self-hostable option could break through these blockers.

For nonprofit organizations operating a fleet of air sensors from different manufacturers, analyzing data from different sources in varying formats can be a challenge. Dr. Collins Gameli Hodoli from *Clean Air One Atmosphere* in Ghana shares, "It has been challenging to develop scripts for varying data formats from varying instruments. One, we have to make sure that all measurement rows and columns, regardless of source, map properly; next, we have to ensure that when two channels are reporting the same measurement, we average them." Collins also shares that a DMS where parameter names are harmonized and standardized is valuable and time-saving for researchers and nonprofits.

EXPLORATORY QUESTIONS

- How many air monitors do you operate?
- What instruments are you using (continuous, filter-based, speciation, sensors)?
- How do you access the data (files, API, data acquisition system, SD card)?
- Do your data come in many different formats?

- Where do you keep your data (database, files)?
- How do you identify parameters and units?
- What quality control (QC) steps do you perform?
- How do you identify QC in your data (QC flags, metadata)?
- How long do you store data (just the latest and/or historical archive)?
- Is a log or chain of custody important?

- What questions are you answering with your data?
- How do you visualize data (charts, maps)?
- Do you use any software or tools to plot data?
- What data averages do you look at?
- Do you share data with the public (in real time)?
- Do you use a metric like an Air Quality Index (AQI)?

WHO IS BEHIND Clean Air COMPASS?

The project's direction is guided by a community of practice (COMPASS), network of core partners representing different geographies and data expertise. These partners have established credibility to secure the stakeholder feedback necessary to build an open-source DMS that will meet the needs of a wide range of organizations monitoring air quality. Additional stakeholders and thought partners are engaged in providing feedback, spreading awareness, and otherwise supporting the project.

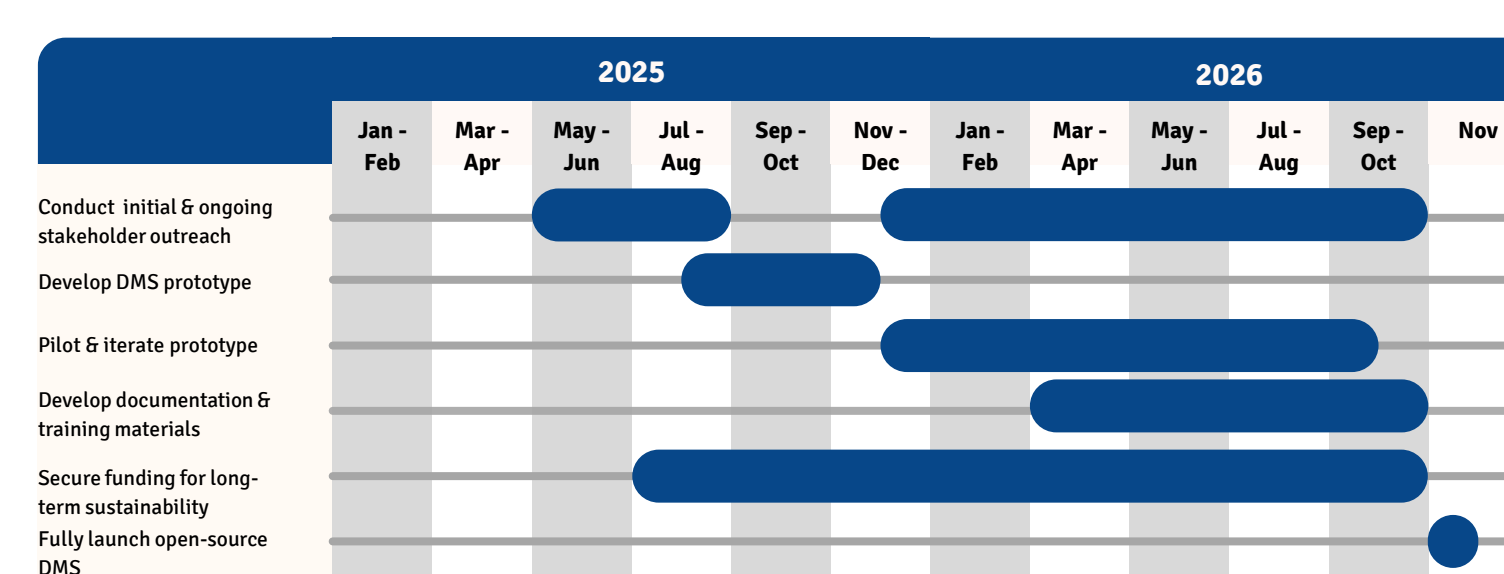
Clean Air COMPASS is led by



Core COMPASS members include



WHAT LIES AHEAD



LEARN MORE

visit our website:
cleanaircompass.org



Check out our Github:
github.com/clean-air-compass

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READ MORE ABOUT THE PROJECT ORIGINS

Clean Air Fund blog: *Data management systems: Vital infrastructure needed to inform action on air quality.*
cleanairfund.org/news-item/data-management-systems

Seed funding
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